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METHOD OF OPERATION  
TRUNK CIRCUITS

Incoming Key End - Arranged For Cross Connecting In Rear Of Desk - Local Test Desk -  
FULL MECHANICAL POWER DRIVEN SYSTEM

GENERAL DESCRIPTION

1. These circuits are two-way trunk circuits between local test desk and, final selector, line switch, sender monitor's desk, or zero operator's position of the local switchboard.

Figure #1 is the key and lamp equipment used with figure #2, #3, #4.  
Figure #1 and #2 shows a ringdown trunk circuit incoming from the final selector and outgoing to a line switch.  
Figure #1 and #3 show a circuit which is used as a tie line circuit between the test desk and another desk. The other end is similar, except that it is not arranged for the flashing signal.  
Figures #1 and #4 show a circuit which is used to provide trunking facilities between the zero operator's position at the switchboard and the local test desk. The other end of this circuit terminates in a jack and is used with cord circuits whose sleeves are grounded through a maximum resistance of 220 ohms.

DETAILED DESCRIPTION

OPERATION

INCOMING FROM FINAL SELECTOR OR OUTGOING TO LINE SWITCH FIGURES #1 and #2.

INCOMING CALLS.

2. When there is an incoming call from a final selector and the mechanical apparatus seizes this trunk, battery is connected to the lead "S", operating the S relay. The S relay operated, closes in part, a locking circuit for the CO relay. When ringing current is applied to the tip and ring of the trunk, the RD relay operates through its inner winding and locks through its outer winding under control of the CO relay. The RD relay operated, closes a circuit from battery through the interrupter, own make contact, break contact of the CO relay, over the lead "F" to ground through the trunk lamps, causing the lamps to flash, until the call is answered.

3. When the call is answered by the trunk key being operated to the talking position, the CO relay operates from battery through its inner winding over the lead

"D", break contact on the holding side of the trunk key, make contact of the talking side of the key to ground over the lead "S-1". The CO relay operated, (a) Locks through its outer winding under control of the S relay. (b) Opens the locking circuit for the RD relay which releases. (c) Disconnects the inner winding of the RD relay from the tip and ring of the trunk, (d) Supplants the interrupted battery with steady battery, thus causing the lamps to remain lighted as busy signals.

4. The operation of the trunk key to the talking position connects a bridge across the tip and ring of the trunk causing, the mechanical apparatus to function.

5. When the trunk key is operated to the holding position, the inner winding of the RD relay is bridged across the tip and ring of the trunk as a holding bridge.

#### DISCONNECT

6. When the trunk key is restored to normal, the bridge is removed from the tip and ring of the trunk, and when the final selector disconnects from this trunk the S relay releases in turn releasing the CO relay. The CO relay released, extinguishes the trunk lamps restoring the circuit to normal.

#### OUTGOING CALLS.

7. When the trunk key is operated to the talking position on an outgoing call, the CO relay operates lighting the trunk lamps as busy signals and disconnecting the inner winding of the RD relay from across the trunk. When the dialing key in the telephone circuit is operated the mechanical apparatus functions. When the line switch moves off normal and finds an idle district, the S relay operates in turn locking the CO relay.

#### DISCONNECT

8. When the trunk key is restored to normal, the bridge is removed from the tip and ring of the trunk, thus causing the mechanical apparatus to return to normal releasing the S relay. The S relay released, releases the CO relay, restoring circuit to normal.

#### INCOMING FROM AND OUTGOING TO SENDER MONITOR'S DESK FIGURES #1 and #3.

#### INCOMING CALLS.

9. When there is an incoming call from the sender monitor's desk, the L relay operates from battery on the lead "S" break contact of the S relay, winding of the



L relay to ground in the auxiliary signal circuit. The L relay operated, closes a circuit from battery through the interrupter, make contact of the L relay, break contact of the S relay over the lead "F" to ground through the trunk lamps thus causing the lamps to flash until the call is answered.

10. When the call is answered by the trunk key being operated to the talking position, the S relay operates from battery through both winding in series to ground over the lead "D". The S relay operated supplants interrupted battery by steady battery, thus causing the trunk lamps to remain lighted as busy signals, and opens the circuit through the L relay and auxiliary signal.

11. There is no holding feature in connection with this circuit.

#### DISCONNECT

12. When the keys at both ends of the trunk are returned to normal the S relay releases, extinguishing the trunk lamps, restoring the circuit to normal.

#### OUTGOING CALLS.

13. When the trunk key is operated to the talking position, on an outgoing call, ground is connected to the lead "D" thus closing a circuit to operate the S relay through its non-inductive and inductive windings in series. The S relay operated, closes a circuit to light the trunk lamps as busy signals and connects battery to the lead "S" to light the trunk lamp at the distant end. The L relay does not operate on an outgoing call.

#### DISCONNECT

14. When the keys at both ends of the trunk are returned to normal the S relay releases, extinguishing the trunk lamps, restoring the circuit to normal.

#### INCOMING FROM AND OUTGOING TO LOCAL SWITCHBOARD FIGURES #1 and #4.

#### INCOMING CALLS.

15. When the plug of a cord is inserted in the jack at the switchboard, battery is connected to lead "S", thus closing a circuit to operate the L relay in series with the auxiliary signal circuit. The L relay operated, causes the trunk lamps to flash from battery through the interrupter and break contact of the S relay over the lead "F" to ground through the trunk lamps.

16. When the call is answered by the trunk key, being operated to the talking position, ground is connected to the lead "D" operating the S-1 relay. The S-1 relay operated, operates the S relay and connects battery and ground through the #54-D retardation coil, to the tip and ring of the trunk extinguishing the supervisory lamp in the distant cord circuit. The S relay operated (a) Locks to ground on the lead "S". (b) Disconnects the L relay and auxiliary signal circuit (c) Supplants the interrupted battery by steady battery, thus keeping the trunk lamps lighted as busy signals.

17. When the trunk key is operated to the holding position, the S-1 relay is held operated and the H resistance is bridged across the tip and ring of the cord preventing the distant cord supervisory lamp from relighting.

#### DISCONNECT

18. When the trunk key is restored to normal, the S-1 relay releases, disconnecting battery and ground from the tip and ring of the trunk relighting the supervisory lamp in the distant cord circuit as a disconnect signal. When the connection is taken down at the switchboard, battery is disconnected from the lead "S", thus allowing the S relay to release. The release of the S relay extinguishes the trunk lamps, restoring the circuit to normal.

#### OUTGOING CALLS

19. When the trunk key is operated to the talking position, ground is connected to the lead "D", operating the S relay. The S relay operated in turn operates the S-1 relay. The S-1 relay operated connects battery through its inner winding to the lead "S" lighting the trunk lamp at the distant end.

#### DISCONNECT

20. When the trunk key is restored to normal, the S-1 relay releases, disconnecting battery and ground from the tip and ring of the trunk, thus allowing the supervisory lamp in the distant cord circuit to light as a disconnect signal. The S relay will not release at this time but will remain operated over the lead "S". When the plug of the cord is removed from the jack at the distant end, ground is removed from the lead "S" thus allowing the S relay to release. The release of the S relay extinguishes the trunk lamps restoring the circuit to normal.



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CIRCUIT REQUIREMENTS

	<u>OPERATE</u>	<u>NON-OPERATE</u>	<u>RELEASE</u>
B136 (RD) Inner wdg. (550 ohms)	Test .013 amp. Readj. .012 amp.		Test .0042 amp. Readj. .0045 amp.
Outer wdg. (475 ohms)	Test .020 amp.		
B139(S)	Test .0009 amp. Readj. .0007 amp.		Test .0002 amp. Readj. .0002 amp.
E370 (S-1)	Test .028 amp. Readj. .018 amp.		Test .0028 amp. Readj. .003 amp.
E380 (L)	Test .0095 amp. Readj. .009 amp.		Test .0009 amp. Readj. .001 amp.
E540 (S) Inner wdg. (500 ohms)	Test .020 amp. Readj. .017 amp.	Test .010 amp. Readj. .011 amp.	
E633 (CO) Inner wdg. (500 ohms)	Test .027 amp. Readj. .022 amp.	Test .013 amp. Readj. .014 amp.	
Outer wdg. (200 ohms)	Test .036 amp.		

ENG.--WES-RV.  
7/21/21.

CHK'D.--FAB.

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